WEST Search History

DATE: Friday, November 14, 2003

Set Name side by side	Query	Hit Count	Set Name result set
DB=USPT; THES=ASSIGNEE; PLUR=YES; OP=OR			
L4	L3 and (diagnos$)	0	L4
L3	L2 and l1	12	L3
L2	((340/539.1 |340/825.69)!.CCLS.)	2365	L2
L1	(notif$ with communication) and wireless and vehicle and @ad<=20000215	232	L1

END OF SEARCH HISTORY

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S (WIRELESS (2N) COMMUNICAT?) AND (DIAGNOSTIC? (2W) TEST) AND (VEHICLE OR AUTOMOBILE

Your SELECT statement is:
   S (WIRELESS (2N) COMMUNICAT?) AND (DIAGNOSTIC? (2W) TEST) AND (VEHICLE
OR AUTOMOBILE OR CAR) AND PD<=991206

           Items   File
           -----   ----
               1    13: BAMP_2003/Nov W2
>>>File 80 processing for PD=  : PD=991206
>>>File 80:     started at PD=19820101 stopped at PD=19871019
               1    80: TGG Aerospace/Def.Mkts(R)_1986-2003/Nov 14
      Examined  50 files
               2   388: PEDS: Defense Program Summaries_1999/May
      Examined 100 files
```

T S2/3/1-9

2/3/1 (Item 1 from file: 13)
DIALOG(R)File 13:BAMP

1104498 Supplier Number: 01770269 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Cool Technology
(Members of the temperature control supply chain look to technology to support good, solid operations)
Article Author(s): McGovern, J Michael
Transportation & Distribution, v 39, n 12, p 25-26,28
December 1998
DOCUMENT TYPE: Journal ISSN: 0895-8548 (United States)
LANGUAGE: English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 1631

2/3/2 (Item 1 from file: 80)
DIALOG(R)File 80:TGG Aerospace/Def.Mkts(R)

01050920 Supplier Number: 39474228
MILTECH NEWS: ANOTHER SALE FOR CLAYMORE
Military Technology, v9, n2, p94
Feb, 1985
Language: English Record Type: Abstract
Document Type: Magazine/Journal; Trade

2/3/3 (Item 1 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

09009025

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY2020
Service: ARMY
Pub. Date: APRIL 19, 1999
Source: Forecast International/DMS
Language: English
Word Count: 22163
Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS2020

2/3/4 (Item 2 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

09008220

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1999
Service: ARMY
Pub. Date: MAY 26, 1998
Source: Forecast International/DMS
Language: English
Word Count: 16906

Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1999

2/3/5 (Item 3 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

00004972

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1998
Service: ARMY
Pub. Date: July 16,1997
Source: Forecast International/DMS
Language: ENGLISH
Word Count: 16008

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1998

2/3/6 (Item 4 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

00004873

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1997
Service: DEFENSE AGENCIES
Pub. Date: July 23,1996
Source: Forecast International/DMS
Language: ENGLISH
Word Count: 14883
Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1997

2/3/7 (Item 5 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

00004576

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1997
Service: ARMY
Pub. Date: May 22,1996
Source: Forecast International/DMS
Language: ENGLISH
Word Count: 18502

Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1997

2/3/8 (Item 6 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

00004161

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1996
Service: ARMY
Pub. Date: October 5,1995
Source: Forecast International/DMS
Language: ENGLISH
Word Count: 14706
Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1996

2/3/9 (Item 7 from file: 388)
DIALOG(R)File 388:PEDS: Defense Program Summaries

00003252

Defense Research Sciences

Binder: PROGRAM ELEMENT DESCRIPTIVE SUMMARY - FY1995
Service: ARMY
Pub. Date: June 13,1994
Source: Forecast International/DMS
Language: ENGLISH
Word Count: 15064
Pgm.Element: 0601102A

Country: UNITED STATES
Industry: AEROSPACE AND DEFENSE
Binder Code: PEDS1995
?

Searching 1976 to present...

Results of Search in 1976 to present db for:
((SPEC/"wireless communication" AND SPEC/"diagnostic test") AND ((SPEC/vehicle OR SPEC/automobile) OR SPEC/car)): 26 patents.
Hits 1 through 26 out of 26

Jump To

Refine Search | SPEC/"wireless communication" AND

	PAT. NO.	Title
1	6,624,750	Wireless home fire and security alarm system
2	6,587,046	Monitoring apparatus and method
3	6,577,229	Multiple protocol smart card communication device
4	6,542,077	Monitoring apparatus for a vehicle and/or a premises
5	6,542,076	Control, monitoring and/or security apparatus and method
6	6,533,316	Automotive electronic safety network
7	6,523,417	End of line seat function and motion tester
8	6,334,778	Remote psychological diagnosis and monitoring system
9	6,330,482	Communications, information, maintenance diagnostic and training system
10	6,295,492	System for transmitting and displaying multiple, motor vehicle information
11	6,276,542	Intelligent public transit system using dual-mode vehicles
12	6,249,724	Intelligent public transit system using dual-mode vehicles
13	6,198,994	Intelligent public transit system using dual-mode vehicles
14	6,169,954	Intelligent public transit system using dual-mode vehicles
15	6,129,449	Self-contained portable computing unit
16	6,094,609	Modular wireless diagnostic, test, and information
17	6,043,461	Over temperature condition sensing method and apparatus for a domestic appliance
18	5,916,287	Modular automotive diagnostic, test and information system
19	5,908,455	High performance automotive diagnostics instrumentation architecture

20 5,884,202 T Modular wireless diagnostic test and information system

21 5,640,155 T Meter cradle with wireless communication port

22 5,378,874 T Diagnostic method and apparatus for a domestic appliance

23 5,349,162 T Fault detection method and apparatus for a domestic appliance

24 5,321,229 T Remote control for a domestic appliance

25 5,309,351 T Communications, information, maintenance diagnostic and training system

26 5,173,855 T Distributed multiple irrigation controller management system

RESULT LIST
2 results found in the EP database for:
"wireless diagnostic" in the title
(Results are sorted by date of upload in database)

1 **SYSTEM AND METHOD FOR FIELD DIAGNOSIS OF WIRELESS COMMUNICATIONS DEVICE SYSTEM SOFTWARE** in my patents lis

Inventor: RAJARAM GOWRI; SECKENDORF PAUL(+1)
Applicant: KYOCERA WIRELESS CORP (
Publication info: **WO03010668** - 2003-02-06
IPC: G06F11/22

2 **A WIRELESS DIAGNOSTIC SYSTEM IN INDUSTRIAL PROCESSES** in my patents lis

Inventor: HAUHIA MARKUS (FI); KREIVI MIKA (FI)(+1)
Applicant: METSO FIELD SYSTEMS OY (
HAUHIA MARKUS (FI)(+2)
Publication info: **WO0205199** - 2002-01-17
IPC: G06F19/00 ; G05B19/418 ; G01M13/00

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S ((RADIO OR WIRELESS) (2N) COMMUNICAT?) AND (DIAGNOSTIC? (2W) TEST?) AND (VEHICLE O

Your SELECT statement is:
   S ((RADIO OR WIRELESS) (2N) COMMUNICAT?) AND (DIAGNOSTIC? (2W) TEST?)
AND (VEHICLE OR CAR OR AUTOMOBILE)

          Items   File
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              3     9: Business & Industry(R)_Jul/1994-2003/Nov 14
              2    13: BAMP_2003/Nov W2
              9    15: ABI/Inform(R)_1971-2003/Nov 14
             25    16: Gale Group PROMT(R)_1990-2003/Nov 14
             28    20: Dialog Global Reporter_1997-2003/Nov 14
              3    47: Gale Group Magazine DB(TM)_1959-2003/Nov 14
              2    63: Transport Res(TRIS)_1970-2003/Oct
              1    80: TGG Aerospace/Def.Mkts(R)_1986-2003/Nov 14
             53   148: Gale Group Trade & Industry DB_1976-2003/Nov 17
              2   149: TGG Health&Wellness DB(SM)_1976-2003/Oct W4
      Examined  50 files
             20   180: Federal Register_1985-2003/Nov 13
              1   258: AP News Jul_2000-2003/Nov 15
              4   275: Gale Group Computer DB(TM)_1983-2003/Nov 14
              7   388: PEDS: Defense Program Summaries_1999/May
      Examined 100 files
RDR FILE 0258 SENT TO   DLGDUMP  RDR AS  0258 RECS 4660 CPY  001 V NOHOLD NOKEEP
RDR FILE 0258 SENT TO   DLGDUMP  RDR AS  0258 RECS 4660 CPY  001 V NOHOLD NOKEEP
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SHOW FILES; DS
File   9:Business & Industry(R) Jul/1994-2003/Nov 14
         (c) 2003 Resp. DB Svcs.
File  13:BAMP 2003/Nov W2
         (c) 2003 Resp. DB Svcs.
File  15:ABI/Inform(R) 1971-2003/Nov 14
         (c) 2003 ProQuest Info&Learning
File  16:Gale Group PROMT(R) 1990-2003/Nov 14
         (c) 2003 The Gale Group
File  20:Dialog Global Reporter 1997-2003/Nov 14
         (c) 2003 The Dialog Corp.
File  47:Gale Group Magazine DB(TM) 1959-2003/Nov 14
         (c) 2003 The Gale group
File  63:Transport Res(TRIS) 1970-2003/Oct
         (c) fmt only 2003 Dialog Corp.
File  80:TGG Aerospace/Def.Mkts(R) 1986-2003/Nov 14
         (c) 2003 The Gale Group
File 148:Gale Group Trade & Industry DB 1976-2003/Nov 17
         (c)2003 The Gale Group
File 149:TGG Health&Wellness DB(SM) 1976-2003/Oct W4
         (c) 2003 The Gale Group
File 180:Federal Register 1985-2003/Nov 13
         (c) 2003 format only The DIALOG Corp
File 258:AP News Jul 2000-2003/Nov 15
         (c) 2003 Associated Press

Set     Items   Description
S1        160   (VEHICLE OR AUTOMOBILE OR CAR) AND ((RADIO OR WIRELESS) (2-
              N) COMMUNICAT?) AND (DIAGNOSTIC? (2W) TEST?)
S2         22   S1 AND PD<=991206
S3         17   RD (unique items)
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S (DOCUMENT (S) (ELECTRONIC (2W) CATALOG?)) AND (DIGITAL (W) SIGNATURE) AND (ENTRIES

Your SELECT statement is:
   S (DOCUMENT (S) (ELECTRONIC (2W) CATALOG?)) AND (DIGITAL (W) SIGNATURE)
AND (ENTRIES OR ENTRY) AND PD<=990709

           Items   File
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      Examined  50 files
      Examined 100 files
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Generate Collection | Print

L3: Entry 5 of 12 File: USPT Feb 26, 2002

US-PAT-NO: 6351221
DOCUMENT-IDENTIFIER: US 6351221 B1

TITLE: Method and apparatus for distance-based notification in a two-way wireless communication system

DATE-ISSUED: February 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Phillips; W Garland	Arlington	TX		
Smith; Dwight Randall	Grapevine	TX		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Motorola, Inc.	Schaumburg	IL			02

APPL-NO: 09/ 334006 [PALM]
DATE FILED: June 15, 1999

INT-CL: [07] G08 B 5/22

US-CL-ISSUED: 340/825.49; 340/572, 340/539, 379/38
US-CL-CURRENT: 340/825.49; 340/539.1, 340/539.23, 340/572.1, 379/38

FIELD-OF-SEARCH: 340/825.49, 340/572, 340/539, 340/825.31, 379/38

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected | Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5218344	June 1993	Ricketts	340/573
☐	5872526	February 1999	Tognazzini	340/961
☐	6151493	November 2000	Sasakura et al.	455/421

ART-UNIT: 2735

PRIMARY-EXAMINER: Horabik; Michael

ASSISTANT-EXAMINER: Shimizu; M

ATTY-AGENT-FIRM: Breeden; R. Louis Bethards; Charles W. Watanabe; Hisashi D.

ABSTRACT:

A group selected from a plurality of portable subscriber units (122) is defined (402), and a plurality of locations corresponding to members of the group are identified (404) by a controller (112) in cooperation with a base station and the group members. The controller determines (406) from the plurality of locations at least one distance between selected ones of the members, and sends (408) a notification when the at least one distance satisfies a predetermined set of rules.

12 Claims, 4 Drawing figures

L3: Entry 5 of 12 File: USPT Feb 26, 2002

DOCUMENT-IDENTIFIER: US 6351221 B1
TITLE: Method and apparatus for distance-based notification in a two-way wireless communication system

Application Filing Date (1):
19990615

Brief Summary Text (2):
This invention relates in general to wireless communication systems, and more specifically to a method and apparatus for distance-based notification in a two-way wireless communication system.

Brief Summary Text (4):
Location-determining technologies are becoming increasingly important in wireless communication systems. Early applications have concentrated primarily on techniques for improving transmission reliability and frequency reuse. Now, as the location-determining technologies mature, a need for location-driven features is emerging.

Brief Summary Text (5):
More specifically, features associated with groups of portable subscriber units for performing notifications based upon distances between members of the groups have not been exploited. Thus, what is needed is a method and apparatus for distance based notification in a two-way wireless communication system.

Brief Summary Text (7):
An aspect of the present invention is a method of distance-based notification in a two-way wireless communication system serving a plurality of portable subscriber units which send and receive messages to and from a controller through a base station. The method comprises in the controller the steps of defining a group selected from the plurality of portable subscriber units, and cooperating with the base station and the group to identify a plurality of locations corresponding to members of the group. The method further comprises determining from the plurality of locations at least one distance between selected ones of the members, and sending a notification when the at least one distance satisfies a predetermined set of rules.

Brief Summary Text (8):
Another aspect of the present invention is a controller for distance-based notification in a two-way wireless communication system serving a plurality of portable subscriber units. The controller comprises a processing system for controlling the two-way wireless communication system, and a base station interface coupled to the processing system for communicating with a base station. The processing system is programmed to define a group selected from the plurality of portable subscriber units, and to cooperate with the base station and the group to identify a plurality of locations corresponding to members of the group. The processing system is further programmed to determine from the plurality of locations at least one distance between selected ones of the members, and to send a notification when the at least one distance satisfies a predetermined set of rules.

Drawing Description Text (2):
FIG. 1 is an electrical block diagram of an exemplary wireless communication system in accordance with the present invention.

Drawing Description Text (5):
FIG. 4 is a flow diagram depicting operation of the exemplary wireless communication

system in accordance with the present invention.

Detailed Description Text (2):
Referring to FIG. 1, an electrical block diagram depicts an exemplary wireless communication system in accordance with the present invention, comprising a fixed portion 102 including a controller 112 and a plurality of conventional base stations 116, the communication system also including a plurality of portable subscriber units 122. The base stations 116 preferably communicate with the portable subscriber units 122 utilizing conventional radio frequency (RF) techniques, and are coupled by conventional communication links 114 to the controller 112, which controls the base stations 116.

Detailed Description Text (3):
The hardware of the controller 112 is preferably a combination of a Choreographer!.TM. network management device, a Wireless Messaging Gateway (WMG.TM.) Administrator!.TM. terminal, an RF-Usher!.TM. multiplexer, and an RF-Conductor!.TM. message distributor manufactured by Motorola, Inc., and utilizes software modified in accordance with the present invention. The hardware of the base stations 116 is preferably a combination of the RF-Orchestra!.TM. transmitter and the RF-Audience!.TM. receiver manufactured by Motorola, Inc. The portable subscriber units 122 are preferably selective call units similar to PageWriter.TM. 2000 data portable subscriber units, also manufactured by Motorola, Inc., and also utilize software modified in accordance with the present invention. It will be appreciated that other similar hardware can be used as well for the controller 112, the base stations 116, and the portable subscriber units 122.

Detailed Description Text (5):
The controller 112 preferably is coupled by telephone links 101 to a public switched telephone network (PSTN) 110 for receiving selective call message originations therefrom. Selective call originations comprising data messages from the PSTN 110 can be generated, for example, from a conventional telephone 111 or a conventional computer 117 coupled to the PSTN 110. It will be appreciated that, alternatively, other types of networks, e.g., a local area network (LAN), a wide area network (WAN), and the Internet, to name a few, can be used for receiving selective call originations. It will be further appreciated that the computer 117 can also function as a server for providing various applications utilized by the wireless communication system. In that mode, the computer 117 can be coupled directly to the controller 112 without going through the PSTN. Alternatively, the computer 117 can be the device that performs part or all of the processing of the present invention, and, when that is the case, can be included within the definition of the controller, as applied herein.

Detailed Description Text (12):
FIG. 4 is a flow diagram depicting operation of the exemplary wireless communication system in accordance with the present invention. The flow begins with the definition 402 of a group selected from the plurality of portable subscriber units 122. Each member of the group is preferably identified by a unique identifier, e.g., a Personal Identification Number (PIN). One of the predetermined sets of rules 338 is also associated with the group members. For example, let a group be defined consisting of two members, A and B. The rule can be: If the distance between A and B becomes less than 30 meters, notify A. This rule could be used by A, for example, to notify A when his boss B is approaching. It will be appreciated that many other variations are possible: If the distance between A and B becomes greater than 1 kilometer, notify both A and B. This could be used, for example, when A and B are traveling in a two-vehicle caravan and do not wish to become separated. Another rule could be: If the distance between A and B is less than 100 meters, notify a third party, C. This could be used, for example, to notify the police when a restraining order is being violated by A, who has been ordered to stay away from B. Additional examples of groups and rules will be described below.

Detailed Description Text (14):
The processing system 310 then sends 408 a notification (or a control command) when the at least one distance satisfies the predetermined set of rules associated with the group. It will be appreciated that the notification can be sent to one or more designated members of the group, as well as to a predetermined additional entity, such as a display terminal in a wired or wireless network. The recipient of the notification preferably is specified in the set of rules for the group. It will be further appreciated that the set of rules can become more complex when the size of the group increases. For example, one can define a group consisting of members A, B,

and C, selected from [redacted] plurality of portable subscri[redacted] units 122. The processing system 310 can then determine a first distance between members A and C, and a second distance between members B and C. The processing system 310 then sends a notification to at least one of members A, B, and C in response to satisfying a rule dependent upon said first and second distances. For example, the rule can be: Notify A when the second distance is greater than 20 meters and the first distance is greater than 50 meters. This rule would be useful, for example, when a parent, A, takes a ten-year old child, B, and a six-year old child, C, to an amusement park. The ten-year old can chaperon the six-year old on an amusement ride, but if the children get separated and the parent is also far away from the six-year old, the parent is notified.

Detailed Description Text (18):
Thus, it should be clear from the preceding disclosure that the present invention advantageously provides a method and apparatus for distance based notification in a two-way wireless communication system. Advantageously, the method and apparatus can handle groups comprising a plurality of members and can generate notifications for group members and other entities, based upon distance relationships between the members satisfying a predetermined set of rules defined for each group.

Current US Cross Reference Classification (1):
340/539.1

CLAIMS:

1. A method of distance-based notification in a two-way wireless communication system serving a plurality of portable subscriber units which send and receive messages to and from a controller through a base station, the method comprising in the controller the steps of:

defining a group selected from said plurality of portable subscriber units, wherein said defining step comprises the step of defining a group comprising members A, B, and C, selected from said plurality of portable subscriber units;

cooperating with said base station and said group to identify a plurality of locations corresponding to members of said group;

determining from said plurality of locations a plurality of distances between selected ones of said members, wherein said determining step comprises the step of determining a first distance between members A and B, and a second distance between members B and C; and

sending a notification when said plurality of distances satisfies a predetermined set of rules concerning said first distance and said second distance of said plurality of distances, wherein said sending step comprises the step of sending said notification to at least one of members A, B, and C in response to satisfying a rule dependent upon said first and second distances.

7. A controller for distance-based notification in a two-way wireless communication system serving a plurality of portable subscriber units, the controller comprising:

a processing system for controlling said two-way wireless communication system; and

a base station interface coupled to said processing system for communicating with a base station,

wherein said processing system is programmed to:

define a group comprising members A, B, and C, selected from said plurality of portable subscriber units;

cooperate with said base station and said group to identify a plurality of locations corresponding to members of said group;

determine from said plurality of locations a plurality of distances between selected ones of said members, said plurality of distances including a first distance between members A and B, and a second distance between members B and C; and

send a notification to at least one of members A, B, and C when said plurality of

distances satisfies a predetermined set of rules concerning said first distance and said second distance of said plurality of distances.

L15: Entry 2 of 3 File: USPT Mar 26, 2002

US-PAT-NO: 6362730
DOCUMENT-IDENTIFIER: US 6362730 B1

TITLE: System and method for collecting vehicle information

DATE-ISSUED: March 26, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Razavi; Behfar	San Jose	CA		
Densmore; Owen M.	Palo Alto	CA		
Martin; Guy W.	San Jose	CA		

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Sun Microsystems, Inc.	Palo Alto	CA			02

APPL-NO: 09/ 332346 [PALM]
DATE FILED: June 14, 1999

INT-CL: [07] B60 Q 1/00

US-CL-ISSUED: 340/438; 340/531, 340/539, 340/439, 701/29
US-CL-CURRENT: 340/438; 340/439, 340/531, 340/539.1, 701/29

FIELD-OF-SEARCH: 340/438, 340/439, 340/539, 340/531, 701/29, 701/32, 701/35

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected | Search ALL

	PAT-NO	ISSUE DATE	PATENTEE-NAME	US-CL
☐	4787040	November 1988	Ames et al.	701/1
☐	4811240	March 1989	Bailou et al.	345/763
☐	4827520	May 1989	Zeinstra	701/1
☐	5227768	July 1993	Beckett et al.	345/600
☐	5303348	April 1994	Botzenhardt et al.	710/114
☐	5400018	March 1995	Scholl et al.	340/438
☐	5442553	August 1995	Parrillo	701/29
☐	5555502	September 1996	Opel	701/36
☐	5640511	June 1997	Botzenhardt et al.	714/47
☐	5732074	March 1998	Spaur et al.	370/313
☐	5732368	March 1998	Knoll et al.	701/1
☐	5751956	May 1998	Kirsch	709/203
☐	5805442	September 1998	Crater et al.	340/825.07
☐	5808197	September 1998	Dao	280/735
☐	5815071	September 1998	Doyle	340/539
☐	5844473	December 1998	Kaman	340/439
☐	5917405	June 1999	Joao	340/415.5
☐	5956487	September 1999	Venkatraman et al.	340/825.07
☐	5974368	October 1999	Schepps et al.	340/825.35
☐	6009355	December 1999	Obradovich et al.	340/336
☐	6009363	December 1999	Beckert et al.	340/825.25
☐	6028537	February 2000	Suman et al.	340/426
☐	6032089	February 2000	Buckley	701/1
☐	6154152	November 2000	Ito	340/988

OTHER PUBLICATIONS

"Jini.TM. Architectural Overview," .COPYRGT.1999 Sun Microsystems, Inc., pp. 1-23.
Abstract for Japanese patent entitled "Electronic Processing System for Equipment Mounted in Vehicle," publication No. 10297392, published Nov. 10, 1998.
Abstract for Japanese patent entitled "Instrument-Panel Image Production Apparatus for Vehicles," publication No. 10297319, published Nov. 10, 1998.
Lind et al., "The Network Vehicle--A Glimpse into the Future of Mobile Multi-Media," .COPYRGT.1998 IEEE, pp. 1-8.
Jameel et al., "Web on Wheels: Toward Internet-Enabled Cars," .COPYRGT.1998 IEEE, pp. 69-76.
Jameel et al., "Internet Multimedia on Wheels: Connecting Cars to Cyberspace," .COPYRGT.1998 IEEE, pp. 637-642.

ART-UNIT: 2632

PRIMARY-EXAMINER: Crosland; Donnie L.

ATTY-AGENT-FIRM: Conley, Rose & Tayon, PC Kivlin; B. Noel

ABSTRACT:

A system and method f[redacted] collecting information from a [redacted]icle wherein the vehicle incorporates an internal network having a device coupled thereto for collecting or generating the vehicle information and a communication device coupled thereto for transmitting the vehicle information to an external receiver. In one embodiment, the devices coupled to the network are addressable using corresponding IP addresses. In another embodiment, the devices are addressable using object terminology which references their respective services. The vehicle information may include location, traffic, diagnostic or other types of information. The vehicle information may be transmitted to the external receiver automatically or the transmission may be initiated by a network user within the vehicle.

20 Claims, 4 Drawing figures

DOCUMENT-IDENTIFIER: US 6362730 B1
TITLE: System and method for collecting vehicle information

Abstract Text (1):
A system and method for collecting information from a vehicle wherein the vehicle incorporates an internal network having a device coupled thereto for collecting or generating the vehicle information and a communication device coupled thereto for transmitting the vehicle information to an external receiver. In one embodiment, the devices coupled to the network are addressable using corresponding IP addresses. In another embodiment, the devices are addressable using object terminology which references their respective services. The vehicle information may include location, traffic, diagnostic or other types of information. The vehicle information may be transmitted to the external receiver automatically or the transmission may be initiated by a network user within the vehicle.

Application Filing Date (1):
19990614

Brief Summary Text (13):
In one embodiment, the in-vehicle network comprises an ethernet, although other embodiments can be implemented in any other type of network. Communication devices such as wireless modems and wireless ethernet allow communications with devices and networks external to the in-vehicle network so that data, software, services and other information can be downloaded from or uploaded to these external sources. The in-vehicle network can also be coupled to an external network through these communication devices so that it can function as a device (a sub-network) on the external network.

Brief Summary Text (14):
In one embodiment, some traditional vehicle components maybe replaced by network devices, thereby providing extended functionality to the driver. For example, the vehicle's dashboard maybe replaced by a monitor which displays images of dashboard instruments, vehicle data and other information to the driver. Graphics generated by a server on the network may be designed to emulate digital or analog gauges which are normally found on a dashboard. The graphics may be varied to suit the preferences of different drivers, or the driver may be able to select different information to be displayed (for example, tabbing from vehicle data to location information, to a radio display, and so on.)

Detailed Description Text (8):
In another embodiment of the invention, an automobile having an in-car network may be coupled to an external network. That is, the in-car network may appear to the external network to have a single IP address. (In this context, the in-car network may be referred to as a "sub-network," while they external network may be referred to as the "primary" network.) The automobile sub-network may include a variety of communication devices through which it may be coupled to the primary network. These devices may include a wireless modem, a cellular packet data (CDPD) modem, a pager or other communication devices. The in-car sub-network operates in cooperation with a land-based proxy server. Because the in-car sub-network uses several different communication devices, it has several different IP addresses (one for each of the communications devices.) These addresses may be dynamically assigned by a service provider. The in-car sub-network communicates to the land-based proxy server of the IP address of the currently-used communication device. Packets which originate on the primary network and which are addressed to the in-car sub-network are directed to the land-based proxy server, which then directs the packets to the in-car

sub-network at the appropriate IP address. The land-based proxy server additionally acts as a buffer when the in-car sub-network is disconnected from the primary network. The land-based proxy server forwards packets which are destined for the disconnected in-car sub-network and delivers the packets when the in-car sub-network is reconnected to the primary network.

Detailed Description Text (9):
The goals of the system can be grouped into three broad categories: hardware independence; service delivery; and software upgradability. The hardware independence of the system is related to the interchangeability of the components of the automobile's sub-network. If, for example, the sub-network includes a graphical display, this display should be replaceable with several different displays, each having unique characteristics. The several displays only need to be able to interface with the sub-network in order to be exchanged. The goal of service delivery relates to the ability to provide new and different services to the vehicle through the sub-network. Although automobiles in the prior art may provide one or two services to the driver, e.g. driver assistance via automatic telephone communications, the equipment for providing these services are dedicated to their respective services and cannot provide distinctly different services. The present system, on the other hand, allows new components or new software to be added to the automobile sub-network and thereby enables new services to be provided to the driver. Finally, software upgradeability relates to the ease with which software systems in the automobile may be upgraded via the automobile sub-network. Rather than manually replacing memory modules or CDs (e.g. containing map data,) the automobile sub-network enables the downloading of new applications or data, as well as the uploading of vehicle diagnostic data or other information, through the network communication devices.

Detailed Description Text (11):
Referring to FIG. 1, an in-car sub-network 10 in one embodiment of the invention is shown. In-car sub-network 10 comprises a utility box 11, network devices 13 and 14, communication device 15 and network cabling 12. These components are installed in vehicle 18. Utility box 11 and network devices 13 and 14 are coupled to cabling 12. Communication device 15 is connected to utility box 11. Each of these devices is addressable on network 10. Although communication device 15 is not directly connected to cabling 12, utility box 11 is configured to recognize packets on the network which are addressed to communication device 15 and to forward these packets to the device. Network 10 can be coupled to an external network through internet service provider 17. In the embodiment depicted in FIG. 1, communication device 15 is a wireless device and is coupled to internet service provider 17 by wireless transmissions 16.

Detailed Description Text (14):
Compute platform 22 includes some type of readable/writeable storage media 25, such as a hard disk or flash memory. As mentioned above, the manufacturer's on-board diagnostic system bus 23 can be coupled to the in-car sub-network. On-board diagnostic system bus 23 is connected to compute platform 22 via an RS-232 connector. The in-car sub-network can also be coupled to an in-car ethernet LAN 24 via the ethernet itself. The in-car sub-network can also be connected to external networks via a set of communication devices. These communication devices include wireless modem 26, CDPD modem 27, cellular phone 29 and wireless ethernet 28. Depending upon the circumstances in which the in-car sub-network is operating, the external network connection may be provided by any one of these communication devices. The in-car sub-network is configured to select one of the devices according to the prevailing operating conditions.

Detailed Description Text (15):
The communication devices identified above (i.e., wireless modems and ethernet transceivers) are typical for network communications. In addition to these devices, however, the in-car sub-network may utilize devices that provide "last-hop" service. Communications from a node on a first network to a node on a second network are typically routed through a number of intermediate networks. Packets may "hop" from the first network to an intermediate network, and then to another network before arriving at the second network. Last hop service is the service that transmits the packets over the last segment of this data path. Because any one of the communication devices of the in-car sub-network may lose communications with the ISP (or other external device,) it is advantageous to have as many possible means for communicating as possible. The in-car sub-network may therefore employ last hop service comprising paging or similar types of communications. These services will

typically be used by transmitting packets to a last hop service transmitter, which will convert the packet data as necessary to make the last hop (e.g., convert the data to text for an alphanumeric pager,) then transmit the data to the in-car sub-network.

Detailed Description Text (18):
In one embodiment, in-car sub-network 20 also includes PDA (personal digital assistant) dock 33, Java Ring reader 34, LCD panel 35, microphone 36 and speakers 37. PDA dock 33 provides a means for passengers in the automobile to connect a PDA to the in-car sub-network. Other embodiments of the invention may include a dock for a laptop computer instead of, or in addition to, PDA dock 33. Java Ring reader 34 is coupled to in-car sub-network 20 to provide a means for controlling access to the network and the functions of the automobile itself. Java Ring reader 34 essentially performs a password function. That is, it identifies a user of the in-car sub-network and provides a particular level of access to network components according to the privilege level of the user. For example, the owner of the automobile may be allowed to access substantially all of the components and functions of the in-car sub-network except for detailed vehicle diagnostic information. A mechanic, on the other hand, may be allowed to access this detailed diagnostic information, but may only be allowed to drive the automobile a limited distance. This mechanism may also be used to personalize the operation of the automobile, adjusting seat positions, radio stations and the like according to the preferences of different drivers. The extent to which this mechanism controls the various functions of the automobile depends, of course, upon the coupling of the related automobile components to the in-car sub-network.

Detailed Description Text (20):
It is contemplated that the vehicle's OBD (on-board diagnostic) system (e.g., item 23 in FIG. 2) will be connected to in-car sub-network 20. The OBD system, as indicated above, is typically of a proprietary design which was not originally intended to be connected to a network. The OBD system may therefore be connected to the network by an interface which is designed as a network device. With the OBD system coupled to the network via the interface device, other devices on the network can query the OBD system for diagnostic information and/or provide information to the OBD system.

Detailed Description Text (35):
As described above, in-car sub-network 60 may include several different devices (e.g., a wireless modem) for communications external to the in-car sub-network. In-car sub-network 60 can switch between these devices as necessary to maintain communications. That is, the network is configured to establish communications using one of the devices and, if at some point communications using this device are no longer possible, to switch to another one of the devices and attempt to re-establish communications using the new device. Because each of these communication devices has a different IP address associated with it, some action must be taken to allow devices in the primary network to properly address packets which are targeted for the in-car sub-network. This can be handled in several different ways.

Detailed Description Text (40):
It should also be noted that the in-car sub-network can operate in a third mode in which it can communicate with the land-based proxy server directly rather than through the ISP. As indicated above, one embodiment of invention includes a wireless ethernet communication device. When the in-car sub-network is within range of the land-based proxy server, a wireless ethernet connection may be established between the two. When it joins the land-based proxy server's LAN, the in-car sub-network can communicate directly to the land-based proxy server on the LAN, or it can communicate with other networks through the LAN's connection to the internet. As will be explained in more detail below, the in-car sub-network can join other networks as well using the wireless ethernet device.

Detailed Description Text (43):
As indicated above, the configuration of the vehicle components as network devices on an in-car sub-network simplifies installation and removal of the devices, hence re-configuration of the vehicle. This system thereby makes it possible to remove outdated components and replace them with new components, even though the new components may have different features or require different data or other signals from the vehicle or its components. Similarly, components which execute associated software, display data or provide services can be upgraded by downloading new software, data or services ("upgrade data") to the components through the in-car

sub-network. This software may be quickly and easily retrieved from sources external to the in-car sub-network, such as web pages or LANs which can be accessed through the communication devices on the in-car sub-network. The software can be retrieved by one device (e.g., a wireless modem,) conveyed through the network and installed in a second device (e.g., a GPS locator) as easily as downloading a web page. The system thereby provides a great deal of flexibility in the hardware and software configurations of the vehicle. In contrast, prior art systems for providing in-car services are tightly coupled to the car manufacturer's choice of hardware and operating system. Changes to the hardware require substantial time, labor and expense. Changes to the software require the original software supplier to provide modified code. The use of Personal Java in the in-car sub-network provides platform independence and also eliminates a substantial portion of the labor, time and costs involved in replacing and upgrading the vehicle's components and functionality.

Detailed Description Text (47):
The operation of the in-car sub-network as a component in an external network can be illustrated in several examples. In one scenario, an automobile having an in-car sub-network is driven to a particular city. In the city, a LAN or MAN (metropolitan area network) is set up to establish a wireless connection to a communication device such as a wireless ethernet device. When the automobile drives within range of the LAN/MAN, a connection is established between the in-car sub-network and the LAN/MAN. The in-car sub-network functions as a single IP device coupled to the LAN/MAN and can retrieve information about the city or otherwise interact with devices on the LAN/MAN. Although the in-car sub-network appears to the LAN/MAN as a single device, nodes on the LAN/MAN can exchange packets with devices within the in-car sub-network as a result of network address translation which is being performed within the in-car sub-network.

Detailed Description Text (48):
In another scenario, a service station may have a wireless LAN so that a vehicle equipped with a network and wireless communication device can establish a connection with the LAN as the vehicle pulls into the station. Once the connection is established, the in-car sub-network and LAN can function as a single network. The service station may be configured to request the service records of the vehicle so that any necessary service may be performed. If a software maintenance update is required by one of the components in the vehicle, a server on the LAN may automatically download this information to the appropriate component. Alternately, the user of the vehicle may request information or services. For example, the user may request that music (e.g., in MP3 format) or videos (e.g., in MPEG-2 format) be downloaded for the passengers' entertainment. The user may also have information he or she wishes to have printed, in which case the information could be transmitted to a printer on the service station's LAN, where it could be picked up by the user.

Current US Cross Reference Classification (3):
340/539.1

CLAIMS:

1. A method for collecting vehicle information comprising: providing a network internal to the vehicle, wherein said network comprises a first device configured to produce vehicle information and a communication device configured for wireless communications, and wherein the network is addressable using a single internet protocol (IP) address, and a reader unit coupled to the network, wherein the reader unit is configured to identify a user of the network and to control access to the network according to a user privilege level; establishing a communications link between said communication device and a receiver external to said network, wherein said receiver is part of an internet service provider; and transmitting vehicle information from said network to said receiver.

7. The method of claim 6 wherein said transmitter requests vehicle location information and wherein said first device comprises a GPS system which transmits said vehicle location information to said receiver in response to said request.

8. The method of claim 1 wherein said transmitter requests vehicle diagnostic information and wherein said first device comprises an onboard diagnostic system which transmits said vehicle diagnostic information to said receiver in response to said request.

19. The system of claim 11 wherein said vehicle information source is configured to

transmit vehicle diagnostic information.

20. The system of claim 11 wherein said vehicle information source is configured to transmit vehicle location information.